

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of tracking an instrument that is inserted into the body of a patient, the method comprising the steps of:

a) detecting a movement signal which represents movement phases of a periodic internal movement of the body, wherein the movement signal comprises both (i) an electrocardiogram movement signal and (ii) a breathing movement signal;

b) generating 2D images of a body volume of interest, and storing each 2D image in an image database together with (i) associated imaging parameters and (ii) an associated movement phase;

c) measuring (i) a current spatial position of the instrument and (ii) a corresponding movement phase of the periodic internal movement of the body comprising (ii)(a) an electrocardiogram movement signal and (ii)(b) a breathing movement signal;

d) selecting at least one 2D image from the image database, wherein selecting the at least one selected 2D image takes place only in response to ascertaining whether it's (i) the at least one 2D image's associated movement phase corresponds to (ii) the movement phase belonging to the current measured spatial position of the instrument, otherwise the selecting does not take place;

e) determining the position of the instrument on the at least one selected 2D image, wherein determining the position of the instrument on the at least one selected 2D image includes using interpolation to calculate a superposed position of the instrument on the 2D image, and wherein determining further includes compensating for a breathing-induced movement of a given body part within the body volume of interest based on a measured breathing position using a movement model of the body part; and

f) superposing the determined position of the instrument on the at least one selected 2D image.

2. (Canceled)

3. (Canceled)

4. (Previously Presented) A method as claimed in claim 1, wherein, in step d), only 2D images from a single movement phase are available for selection from the image database, wherein selecting further includes ascertaining whether or not the single movement phase corresponds to the movement phase of the current measured spatial position of the instrument, and wherein the determined position of the instrument to be superposed on a display of the at least one selected 2D image will only be represented when the movement phase of the current measured spatial position of the instrument corresponds to the single movement phase of the 2D images.

5. (Previously Presented) A method as claimed in claim 1, wherein steps b) and c) to e) are carried out a number of times and in varying order.

6. (Previously Presented) A method as claimed in claim 1, wherein the associated imaging parameters in the image database for corresponding 2D images include various projection directions.

7. (Previously Presented) A method as claimed in claim 1, wherein the 2D images are generated in step b) by means of X-radiation and/or ultrasound.

8. (Previously Presented) A method as claimed in claim 1, wherein at least one reference probe is fitted on a movable X-ray device which is provided for generating the 2D images.

9. (Previously Presented) A method as claimed in claim 1, wherein at least one reference probe is arranged on or in the body of the patient.

10. (Canceled)

11. (Currently Amended) An arrangement for tracking an instrument that is inserted into the body of a patient, the arrangement comprising:

- a) a device for generating 2D images of a body volume of interest;
- b) a unit for determining imaging parameters of the 2D image generating device;
- c) a signal measurement unit for detecting a movement signal which represents movement phases of a periodic internal movement of the body, wherein the movement signal comprises both (i) an electrocardiogram movement signal and (ii) a breathing movement signal;
- d) a storage unit for storing an image database of 2D images of the body volume together with (i) associated imaging parameters and (ii) associated movement phases;
- e) a position measurement unit for measuring (i) a current spatial position of the instrument that is inserted into the body and (ii) a corresponding movement phase of the periodic internal movement of the body, the corresponding movement phase including both (ii)(a) an electrocardiogram movement signal and (ii)(b) a breathing movement signal; and
- d) a control and computation unit for selecting at least one 2D image from the image database, wherein selecting the at least one ~~selected~~ 2D image ~~corresponds in terms of its~~ takes place only in response to ascertaining whether (i) the at least one 2D image's associated movement phase corresponds to (ii)

to the current measured spatial position of the instrument, and for determining a superposed position of the instrument on the at least one selected 2D image, wherein determining the superposed position of the instrument on the at least one selected 2D image includes using interpolation to calculate the superposed position of the instrument on the 2D image, and wherein determining further includes compensating for a breathing-induced movement of a given body part within the body volume of interest based on a measured breathing position using a movement model of the body part.

12. (Previously Presented) An arrangement as claimed in claim 11, wherein it is designed for carrying out a method as claimed in claim 1.

13. (Currently Amended) An instrument tracking system for tracking an instrument that is inserted into the body of a patient, the instrument comprising:

a) a means for generating and storing 2D images of a volume of interest in a body prior to insertion of an instrument into the body;

b) a means for measuring movement phases of a periodic internal movement of the body, wherein the periodic internal movement comprises both (i) a cardiac system movement and (ii) a respiratory system movement;

c) a means for correlating said 2D images with said movement phases;

d) a means for tracking (i) a current spatial position of the instrument upon insertion into the body and (ii) a corresponding movement phase of the periodic internal movement of the body comprising (ii)(a) an electrocardiogram movement signal and (ii)(b) a breathing movement signal;

e) a means for selecting a stored 2D image based on real-time measurement of the movement phases, wherein selecting the selected stored 2D image corresponds in terms of its takes place only in response to ascertaining whether (i) the stored 2D image's associated movement phase corresponds to (ii) the movement phase belonging to the tracked current spatial position of the instrument;

f) a means for determining a superposed position of the instrument on the selected stored 2D image, wherein determining the superposed position of the instrument on the selected stored 2D image includes using interpolation to calculate the superposed position of the instrument on the 2D image, and wherein determining further includes compensating for a breathing-induced movement of a given body part within the body volume of interest based on a measured breathing position using a movement model of the body part; and

g) a means for superimposing the determined position of the instrument with the selected stored 2D image.

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Previously Presented) The instrument tracking system of claim 13, further comprising at least one reference probe positioned on at least one of (i) the means for generating 2D images and (ii) the body.